

P **ERLESS**
PATENTED
BOILERS

STEAM
WATER



PEERLESS HEATER CO.
PITTSBURGH, PA.

Peerless Patented Boilers

Steam and Water



1923 Catalogue

SUPERSEDING ALL PREVIOUS ISSUES

Manufactured by
PEERLESS HEATER COMPANY

PITTSBURGH, PA., U.S.A.

**431 Walnut St.,
PHILA., PA.**

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DO NOT READ THIS

UNLESS YOU ARE BROAD-MINDED, WILLING TO BE CONVINCED AND WILL ACT STRICTLY
ACCORDING TO THE MECHANICAL MERITS OF THE PROPOSITION

WHICH

Type of Boiler Would You Prefer to Install?

- | | |
|--|--|
| 1. A boiler made of a special alloy mixture, and thoroughly tested to 80 lb. cold water pressure to the square inch, before it is shipped to you; | OR <i>One made of common brittle gray iron, of unknown tensile strength?</i> |
| 2. A boiler with a Patented crown sheet formed of half spheres, increasing the direct heating surface by half—without adding to the water in the boiler—thus giving the first intense heat of the fire $1\frac{1}{2}$ times as much surface on which to play, as if this feature were omitted; in other words—a boiler that has $1\frac{1}{2}$ times as much <i>real, live, prime heating surface</i> as others; | OR <i>One that has so-called "prime" surface, employing large, overhanging projections in the firebox or headers on the top and sides of boiler, holding as much as three gallons of unnecessary water to each section of the boiler, or 30 gallons in an average size boiler, thereby requiring fuel consumption to keep the water at the proper temperature?</i> |
| 3. A boiler with Patented "S" shaped arms as shown in cuts which follow, adding as much direct surface as if the boiler had two crown sheets for the fire to play on instead of one, thereby getting the maximum efficiency out of the fuel; | OR <i>One that can not have this feature, lessening the efficiency and economy of the boiler by this lack of prime surface?</i> |
| 4. A boiler in which the inside walls are "V" shaped; the points of the "V" projecting into the fire zone and adding $\frac{1}{3}$ more prime surface than an ordinary flat wall; | OR <i>One that does not have this feature?</i> |
| 5. A boiler-constructed with push nipple connections, making a perfect "iron to iron" joint as is used in all high pressure, factory, marine and locomotive boilers, thus proving the efficiency and superiority of this style of joint; | OR <i>One with the ordinary inferior, leaky screw nipple joints, which, in the majority of cases, means many trips to the job "tightening up" the joints?</i> |
| 6. A boiler embodying the principles (not construction) of a fire engine boiler, namely: direct application of the greatest possible amount of heat through a great prime heating surface; | OR <i>A boiler built along the ordinary lines, requiring an hour or so to generate steam, and a heavy consumption of fuel to hold up the required pressure?</i> |

SUCH IS!

SUCH IS NOT !

THE PEERLESS BOILER

PEERLESS PATENTED STEAM AND WATER BOILERS


 HE remarkable heat efficiency and quick steam qualities of the Peerless Patented Boiler are due to its large and effective heating surface. Fig. 1 shows the design of the crown plate. The surface of each square foot of this crown plate is made up of 16—3-inch cup shaped or hemispherical arches. The immense increase in heating surface thus secured without increasing the volume of water to be heated, is capable of very accurate mathematical proof as follows:



FIGURE 1

Area of a circle = $D^2 \times .7854$.

Area of a sphere = $D^2 \times 3.1416 = 4$ times the area of a circle of equal diameter.

Area of hemisphere = $D^2 \times 1.5708 = 2$ times area of a circle of equal diameter.

1 square foot = 144 sq. in.

Deducting the area of 16—3-inch circles ($16 \times 9 \times .7854 = 113.0976$ sq. in.) from each square foot we have $144 - 113.0976 = 30 +$ sq. in. surface remaining.

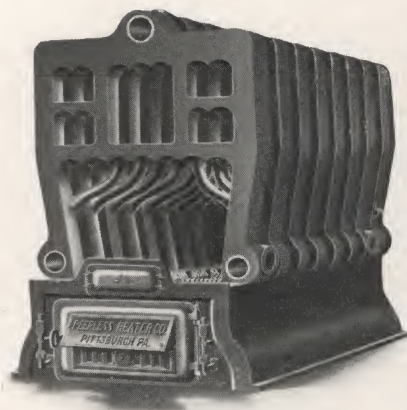
Adding the area of 16—3-inch hemispheres ($16 \times 9 \times 1.5708 = 226.1952$ sq. inches) to the remaining surface of each square foot we have 30.9024 sq. in. + 226.1952 sq. in. = 257.0976 sq. in. total heating surface.

257.0976 sq. in. — 144 sq. in. = 113.0976 sq. in. increase of heating surface by hemispherical design.

Percentage of increase, $78 +$ per cent.

It will be noted that by using the "hemisphere" construction an area of heating surface is added to the boiler just equal to the areas of the circles that form the bases of each hemisphere.

The above figures give ONE very strong reason why Peerless Patented Boilers will heat a given amount of water quicker and with less fuel than any other boiler on the market.



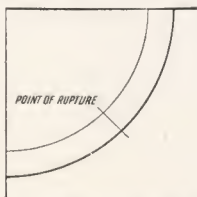
INTERIOR VIEW OF BOILER FIG. 2

Since the tubes heat more rapidly than the walls of the boiler, to which its ends are affixed, and therefore have a different rate of expansion, the curved tube will fail at point of greatest strain. This failure has repeatedly occurred in boilers that use curved tubes, after being a short time in service.

In the curved tube the point of greatest strain is at the point of greatest curvature and the direction of strain is perpendicular to a tangent at that point.

This has occurred to such an extent that most of the manufacturers have been compelled to discontinue manufacturing boilers of cast-iron with water tubes, which you can readily understand by referring to Fig. 3.

If the curve is a double one, such as in the Patented "S" tubes shown in Figs. 2 and 4, maximum strains will come at "b" and "b-1" and, being almost equal and opposite in direction they neutralize each other. The lesser strains at "a" and "a-1" are similarly balanced. Thus the "S" shaped tube is absolutely proof against failure due to the strains resulting from expansion when hot. This "S" shaped tube is an exclusive "Peerless" feature since it is thoroughly protected by patents against being used by other manufacturers.

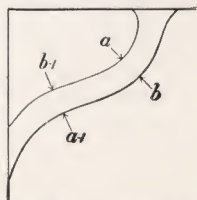


CUT OF CURVED TUBE—FIG. 3



ANOTHER reason for the superiority of PEERLESS Patented Boilers over other makes is found in the Patented "S" shaped water tubes or braces which are used in all the larger sizes of Peerless boilers. These "S" tubes, which serve as water tubes as described on page 16, are made with a reverse curve to avoid failure due to the strains incident to expansion when hot.

In Fig. 3 is shown the curved tube used in some other makes of boilers. In any curved tube with fixed ends the greatest strain, when thermal expansion occurs, is at the point farthest from each end of the tube and nearest the applied heat.



CUT OF PAT. "S" TUBE—FIG. 4



STEAM—18 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
418	18x21	450	8	2-3 in.	4
518	18x27½	600	8	2-3 in.	5
618	18x34	800	8	2-3 in.	6
718	18x40½	950	8	3-3 in.	7

Height of boiler, 48 inches. Water line, 40½ inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.



WATER—18 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
418	18x21	800	8	2-3 in.	4
518	18x27½	1100	8	2-3 in.	5
618	18x34	1350	8	2-3 in.	6
718	18x40½	1600	8	3-3 in.	7

Height of boiler, 48 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.

PEERLESS



STEAM—24 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
424	24½x21	750	10	2-3 in.	4
524	24½x27½	950	10	2-3 in.	5
624	24½x34	1150	10	2-3 in.	6
724	24½x41½	1350	10	3-3 in.	7
824	24½x48	1600	10	3-3 in.	8

Height of boiler, 54 inches. Water line, 44 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.



WATER—24 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
424	24½x21	1250	10	2-3 in.	4
524	24½x27½	1600	10	2-3 in.	5
624	24½x34	1900	10	2-3 in.	6
724	24½x41½	2250	10	3-3 in.	7
824	24½x48	2600	10	3-3 in.	8

Height of boiler, 54 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.



STEAM—30 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
530	32x28	1475	12	2-4 in.	5
630	32x34½	1800	12	2-4 in.	6
730	32x41	2175	12	2-4 in.	7
830	32x47½	2500	12	2-4 in.	8
930	32x54	2850	12	3-4 in.	9
1030	32x60½	3200	12	3-4 in.	10

Height of boiler, 62 inches. Water line, 48 inches. See note regarding rating on page 35. See page thirty-nine for additional details of measurements.



WATER—30 SERIES

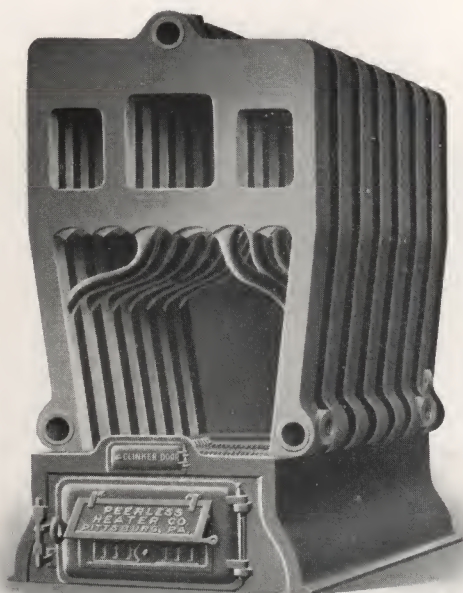
No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
530	32x28	2450	12	2-4 in.	5
630	32x34½	3000	12	2-4 in.	6
730	32x41	3625	12	2-4 in.	7
830	32x47½	4175	12	2-4 in.	8
930	32x54	4750	12	3-4 in.	9
1030	32x60½	5325	12	3-4 in.	10

Height of boiler, 62 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.

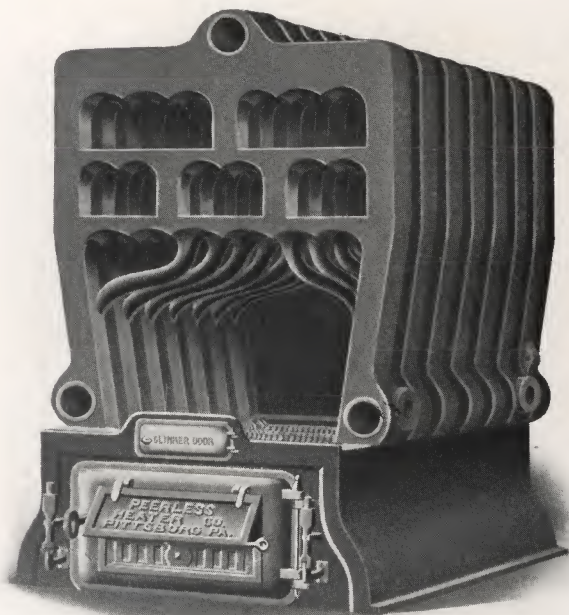
PEERLESS



INTERIOR VIEW—18 AND 24 SERIES



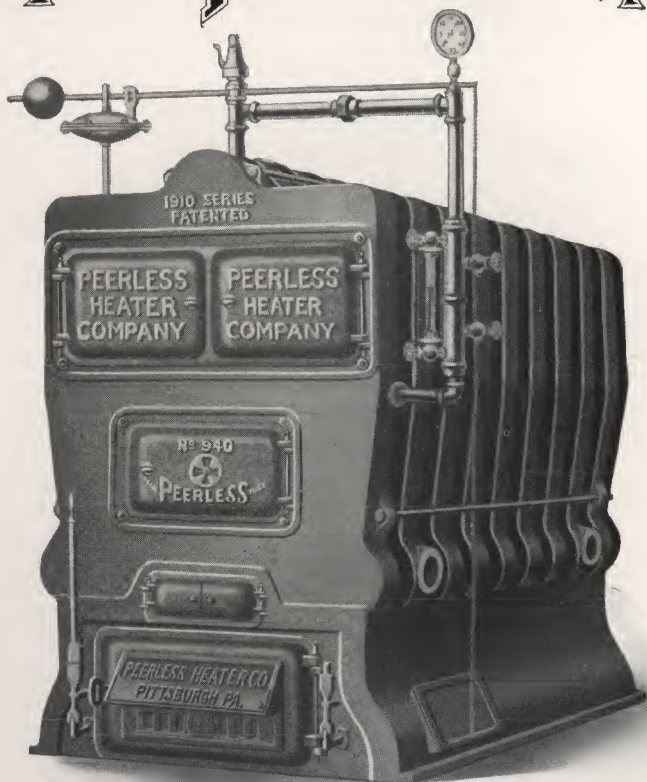
In the 30 and 40 series boilers, we have adopted the Interior Patented "S" arms to our 18 and 24 series boilers; these tubes (two to each section of the boiler) being cast in one piece with the section, start in the central part of the arched crown sheet, and run into the leg of the section on either side, giving the same greater percentage of prime heating surface as if these boilers had crown sheets double the actual size, the same principle as embodied in our larger sectional boilers.



INTERIOR VIEW—30 SERIES


PEERLESS boilers are an innovation in heating, employing in their construction patented features which no other boiler possesses. The Crown Sheet in every type of Peerless boiler is formed of cup-shaped, semi-spherical arches which present to the direct fire $1\frac{1}{2}$ times as much prime surface as if this feature were not employed—without adding to the water in the boiler—an all important consideration, as every additional gallon of water requires additional fuel to maintain the proper temperature.

PEERLESS



STEAM—40 SERIES

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
640	44x38	3000	16	2-5 in.	6
740	44x45½	3675	16	2-5 in.	7
840	44x53	4350	16	3-5 in.	8
940	44x60½	5025	16	3-5 in.	9
1040	44x68	5650	16	3-5 in.	10
1140	44x75½	6250	16	4-5 in.	11
1240	44x83	6900	16	4-5 in.	12
1340	44x90½	7475	16	4-5 in.	13
1440	44x98	8150	16	4-5 in.	14
1540	44x105½	8825	16	5-5 in.	15
1640	44x113	9500	16	5-5 in.	16

Height of boiler, 70 inches. Water line, 51 inches. See note regarding rating on page 35. See page thirty-nine for additional details of measurements.



WATER—40 SERIES

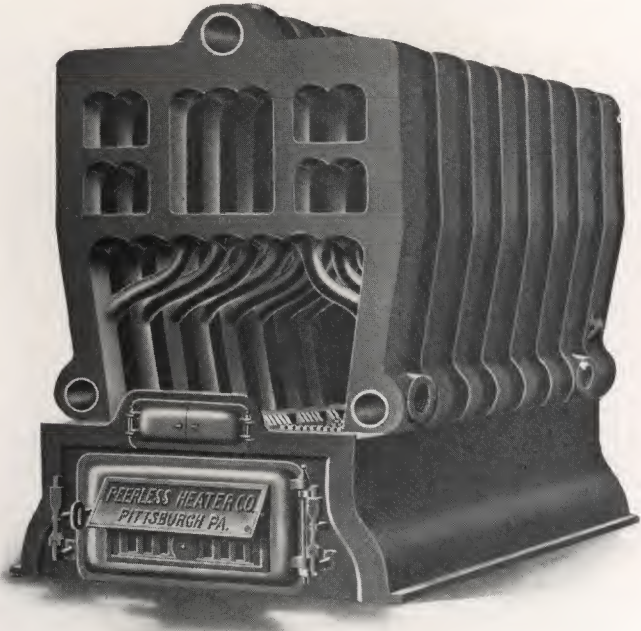
No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
640	44x 38	5100	16	2-5 in.	6
740	44x 45½	6225	16	2-5 in.	7
840	44x 53	7250	16	3-5 in.	8
940	44x 60½	8375	16	3-5 in.	9
1040	44x 68	9400	16	3-5 in.	10
1140	44x 75½	10450	16	4-5 in.	11
1240	44x 83	11500	16	4-5 in.	12
1340	44x 90½	12450	16	4-5 in.	13
1440	44x 98	13600	16	4-5 in.	14
1540	44x105½	14725	16	5-5 in.	15
1640	44x113	15850	16	5-5 in.	16

Height of boiler, 70 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page thirty-five.

PEERLESS



INTERIOR VIEW—40 SERIES

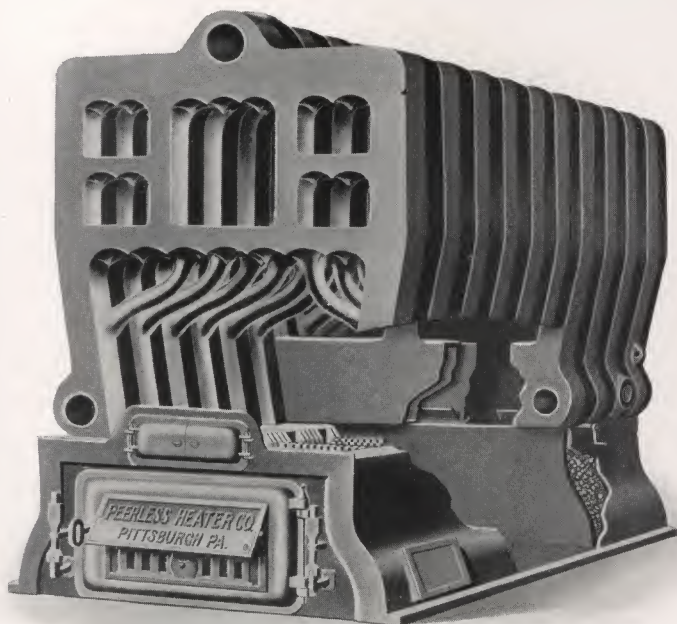


PARTICULAR attention is called to the Patented "S" arm water tubes which are introduced in our sectional boilers. These tubes (two to each section of the boiler) being cast in one piece with the section, start in the central part of the arched crown sheet and run into the leg of the section on either side. This feature of construction is a unique one, and adds as much prime heating surface as if these boilers had crown sheets double their actual size. Splitting up the waterways into small streams of about two inches in diameter makes these boilers very quick steamers. This is readily understood, as it is a well-known fact that transmission of heat to a small body of water is much more rapid than to a large body of water, and the fuel consumption relatively reduced.

Many cast-iron heating boilers of today are built according to the principle of the old style return tubular boilers which have been replaced in all up-to-date power plants by the water tube boiler.

Peerless boilers compare to other boilers on the market as the water tube boiler compares to the old style return tubular boiler; that is, *fuel saving* against *fuel wasting*.

PEERLESS



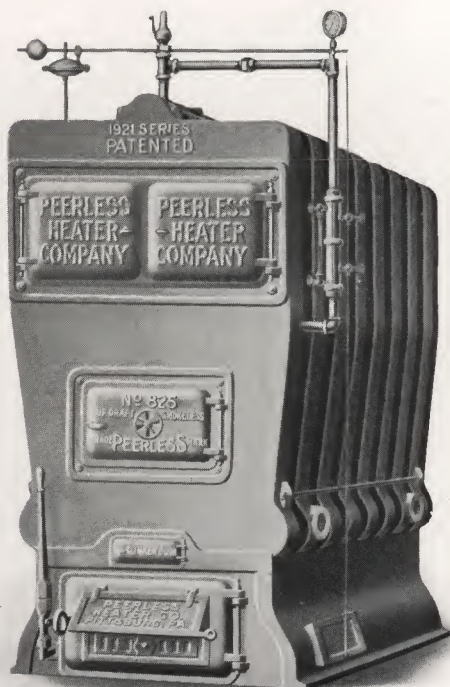
INTERIOR VIEW—48 SERIES UP-DRAFT SMOKELESS

SMOKELESS combustion is attained by the proper mixing of air and the gases produced by the burning of the fuel. By the introduction into our sectional boilers of a bridgewall section with baffling plates and draft regulation, we put the fire under positive control. Primary combustion takes place as in any straight draft boiler. Secondary combustion occurs just past the bridgewall section. Air is heated by passing under the grates and up through the port between the bridgewall and the baffling plate, which is heated by the hot gases in the rear combustion chamber. The heated air mixes with the partly burned gases from the front of the bridgewall and complete combustion is accomplished. The wide-open position of the damper allows an excess of air. By adjusting it, the amount of secondary air necessary may be admitted to the boiler furnace.

Smokeless combustion means, in addition to smoke prevention, a considerable increase in boiler efficiency, and, consequently, a saving in fuel.

Peerless Smokeless Boilers have no parts to burn out and be replaced.

PEERLESS



STEAM—25 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
825	24½x32	1600	10	3-3 in.	8	5
925	24½x39½	1800	10	3-3 in.	9	6
1025	24½x39½	2000	10	3-3 in.	10	6
1125	24½x46	2200	10	4-3 in.	11	7

Height of boiler, 54 inches. Water line, 44 inches.
 See page thirty-nine for additional details of measurements.
 See note regarding rating on page 35.



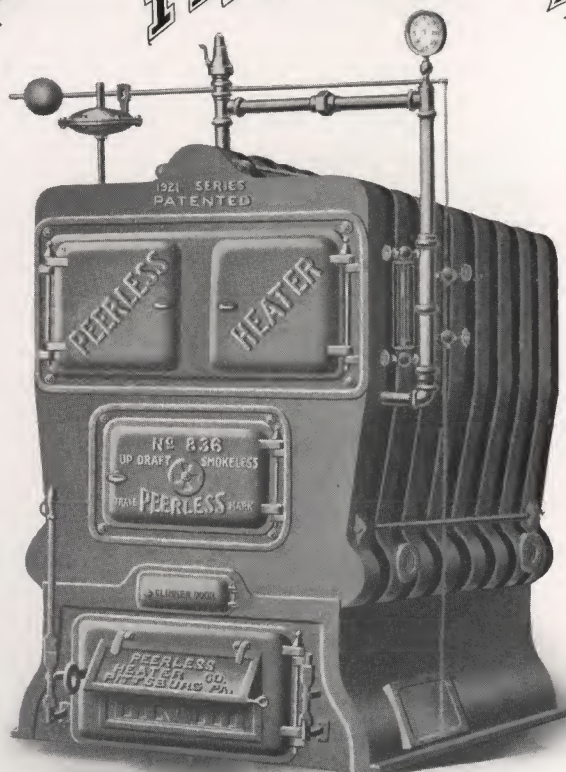
WATER—25 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
825	24½x32	2600	10	3-3 in.	8	5
925	24½x39½	2950	10	3-3 in.	9	6
1025	24½x39½	3300	10	3-3 in.	10	6
1125	24½x46	3650	10	4-3 in.	11	7

Height of boiler, 54 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page 35.



STEAM—36 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
836	32x32½	2600	12	2-4 in.	8	5
936	32x39	2900	12	3-4 in.	9	6
1036	32x45½	3200	12	3-4 in.	10	7
1136	32x52	3500	12	3-4 in.	11	8
1236	32x52	3800	14	3-4 in.	12	8
1336	32x58½	4100	14	4-4 in.	13	9

Height of boiler, 62 ins. Water line, 48 ins. See note regarding rating on page 35.
See page thirty-nine for additional details of measurements.



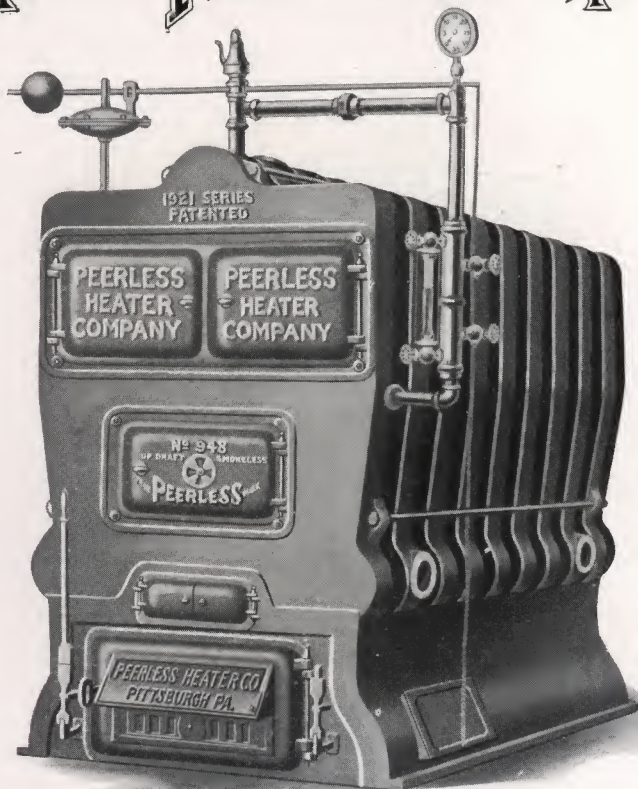
WATER—36 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
836	32x32½	4300	12	2-4 in.	8	5
936	32x39	4800	12	3-4 in.	9	6
1036	32x45½	5300	12	3-4 in.	10	7
1136	32x52	5800	12	3-4 in.	11	8
1236	32x52	6300	14	3-4 in.	12	8
1336	32x58½	6800	14	4-4 in.	13	9

Height of boiler, 62 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page 35.



STEAM—48 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
848	44x38	4550	16	3-5 in.	8	5
948	44x45½	5225	16	3-5 in.	9	6
1048	44x53	5850	16	3-5 in.	10	7
1148	44x60½	6450	16	4-5 in.	11	8
1248	44x60½	7100	16	4-5 in.	12	8
1348	44x68	7675	16	4-5 in.	13	9
1448	44x75½	8350	16	4-5 in.	14	10
1548	44x83	9025	16	5-5 in.	15	11
1648	44x83	9700	16	5-5 in.	16	11
1748	44x90½	10325	18	5-5 in.	17	12
1848	44x90½	11050	18	5-5 in.	18	12
1948	44x98	11725	18	5-5 in.	19	13
2048	44x98	12400	18	5-5 in.	20	13

Height of boiler, 70 inches. Water line, 51 inches. See note regarding rating on page 35. See page thirty-nine for additional details of measurements.



WATER—48 SERIES UP-DRAFT SMOKELESS

No. of Boiler	Fire Pot (Inches)	Rating Sq. Ft.	Smoke Pipe (Inches)	Tapping	No. of Sections	No. of Grates
848	44x38	7600	16	3-5 in.	8	5
948	44x45½	8600	16	3-5 in.	9	6
1048	44x53	9600	16	3-5 in.	10	7
1148	44x60½	10600	16	4-5 in.	11	8
1248	44x60½	11600	16	4-5 in.	12	8
1348	44x68	12600	16	4-5 in.	13	9
1448	44x75½	13800	16	4-5 in.	14	10
1548	44x83	15000	16	5-5 in.	15	11
1648	44x83	16200	16	5-5 in.	16	11
1748	44x90½	17400	18	5-5 in.	17	12
1848	44x90½	18600	18	5-5 in.	18	12
1948	44x98	19800	18	5-5 in.	19	13
2048	44x98	21000	18	5-5 in.	20	13

Height of boiler, 70 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page 35.



STEAM—38 SERIES DOWN-DRAFT

No. of Boiler	Grate Area Sq. Ft.	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
538	6.32	1650	12	2-4 in.	5
638	8.85	2075	12	2-4 in.	6
738	8.85	2600	12	2-4 in.	7
838	11.38	3000	14	3-4 in.	8
938	11.38	3400	14	3-4 in.	9
1038	13.90	3800	14	4-4 in.	10
1138	13.90	4200	14	4-4 in.	11
1238	16.42	4600	14	4-4 in.	12
1338	16.42	5000	14	4-4 in.	13

Height of boiler, 72 inches. Water line, 58 inches. See note regarding rating on page 35. See page 39 for additional details of measurements. See page thirty for chimney sizes.

PEERLESS



WATER—38 SERIES DOWN-DRAFT

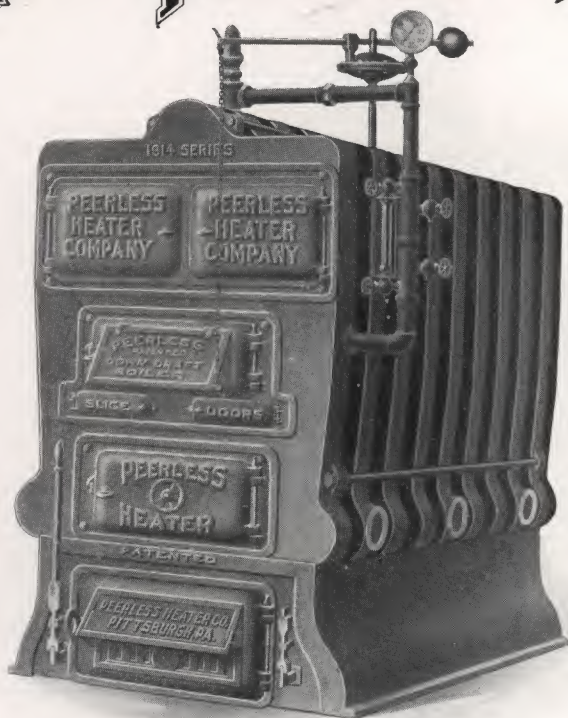
No. of Boiler	Grate Area Sq. Ft.	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
538	6.32	2700	12	2-4 in.	5
638	8.85	3425	12	2-4 in.	6
738	8.85	4150	12	2-4 in.	7
838	11.38	4875	14	3-4 in.	8
938	11.38	5600	14	3-4 in.	9
1038	13.90	6325	14	4-4 in.	10
1138	13.90	7050	14	4-4 in.	11
1238	16.42	7775	14	4-4 in.	12
1338	16.42	8500	14	4-4 in.	13

Height of boiler, 72 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page 35.

See page thirty for chimney sizes.



STEAM—50 SERIES DOWN-DRAFT

No. of Boiler	Grate Area Sq. Ft.	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
650	13.86	3500	16	2-5 in.	6
750	13.86	4200	16	2-5 in.	7
850	17.81	4900	16	3-5 in.	8
950	17.81	5600	16	3-5 in.	9
1050	21.76	6300	16	3-5 in.	10
1150	21.76	7000	16	4-5 in.	11
1250	25.71	7700	16	4-5 in.	12
1350	25.71	8400	16	4-5 in.	13
1450	29.66	9100	16	4-5 in.	14
1550	29.66	9800	16	4-5 in.	15
1650	33.61	10500	16	4-5 in.	16
1750	33.61	11200	16	5-5 in.	17
1850	37.56	11900	16	5-5 in.	18

Height of boiler, 82 inches. Water line, 63 inches.

See page thirty-nine for additional details of measurements.

See note regarding rating on page 35.

See page thirty for chimney sizes.



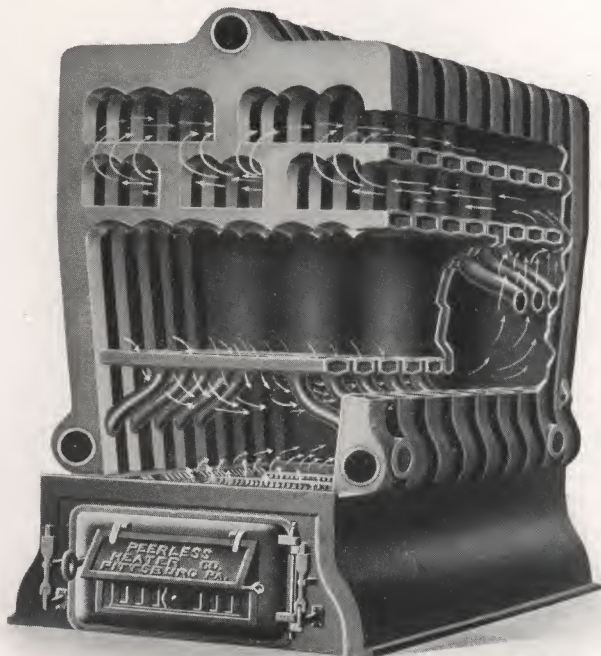
WATER—50 SERIES DOWN-DRAFT

No. of Boiler	Grate Area Sq. Ft.	Rating Sq. Ft. (Note)	Smoke Pipe (Inches)	Tapping	No. of Sections
650	13.86	5600	16	2-5 in.	6
750	13.86	6800	16	2-5 in.	7
850	17.81	7850	16	3-5 in.	8
950	17.81	8950	16	3-5 in.	9
1050	21.76	9950	16	3-5 in.	10
1150	21.76	10950	16	4-5 in.	11
1250	25.71	11950	16	4-5 in.	12
1350	25.71	12950	16	4-5 in.	13
1450	29.66	13950	16	4-5 in.	14
1550	29.66	14975	16	4-5 in.	15
1650	33.61	16000	16	4-5 in.	16
1750	33.61	17000	16	5-5 in.	17
1850	37.56	18000	16	5-5 in.	18

Height of boiler, 82 inches. See note regarding rating on page 35.

See page 39 for additional details of measurements. See page 30 for chimney sizes.

HP PEERLESS HP

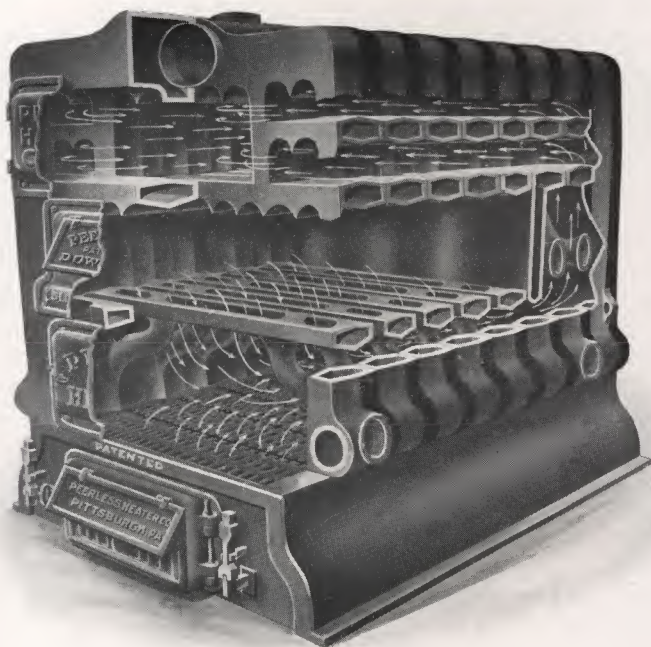


INTERIOR VIEW OF 38 SERIES DOWN-DRAFT



HIS smaller series has embodied in its interior construction the same **PATENTED** features that made our 50 series boiler meet with the instant approval of the heating trade. Notice that we have placed under the water grates our patented "S" shaped arms in order to quicken the circulation of water through the grates and increase our heating surface where the heat was most intense—between the fire on the upper grates and the lower grates.

See page thirty for chimney sizes.



INTERIOR VIEW OF 50 SERIES DOWN-DRAFT


 U T - A W A Y view showing position of the Water Grates, the heating surfaces, the two combustion chambers, the lower grates, feeding and slicing doors, which with the other features shown, bring about smokeless results in burning soft coal.

In addition to these features, particular attention is called to the patented "S" arm water tubes, the feature of our regular cast-iron boilers, making them so efficient and economical, splitting up the water ways into small streams of water, making quick steam and responsive circulation, with the minimum amount of fuel. The most efficient and economical type of down-draft boiler on the market.

See page thirty for chimney sizes.



PROPER METHOD OF STARTING FIRE IN DOWN-DRAFT BOILER

FIRST:—Place a heavy layer of wood on both the upper and lower grates. Throw about six or eight inches of coal on top of the layer of wood on the upper grates, then put a layer of wood over the coal.

Start the lower fire first, taking the air for combustion through the ash-pit door. Close upper fire-door. When the wood and coal ignite on the upper grates, open the upper fire-door and gradually close off the draft through the ash-pit door until it is tightly closed. From then on, feed coal on upper grates only—feed no coal on lower grates. Take all the air for combustion through the draft-door in the upper feed door after the fire is well started.

If the above instructions are carefully followed there will be little or no smoke in starting a new fire.

CHIMNEYS FOR DOWN-DRAFT BOILERS

On account of the greater chimney capacity required for down-draft, they should not be installed except where first-class flues are provided. We give below an approximate table of the minimum sizes of chimneys which should be used, and care should be taken to see that they run well up above surrounding buildings or other obstacles, and that the boiler flue is not used for other purposes:

Boilers up to 2075' Steam and corresponding sizes of Hot Water	
Boilers	12'' x 12'' x 60'
From 2075' to 2600' Steam and corresponding sizes of Hot Water	
Boilers	12'' x 16'' x 60'
From 2600' to 3800' Steam and corresponding sizes of Hot Water	
Boilers	16'' x 16'' x 65'
From 3800' to 5000' Steam and corresponding sizes of Hot Water	
Boilers	20'' x 20'' x 70'
From 5000' to 7700' Steam and corresponding sizes of Hot Water	
Boilers	24'' x 24'' x 80'
From 7700' to 11,900' Steam and corresponding sizes of Hot	
Water Boilers	28'' x 28'' x 90'



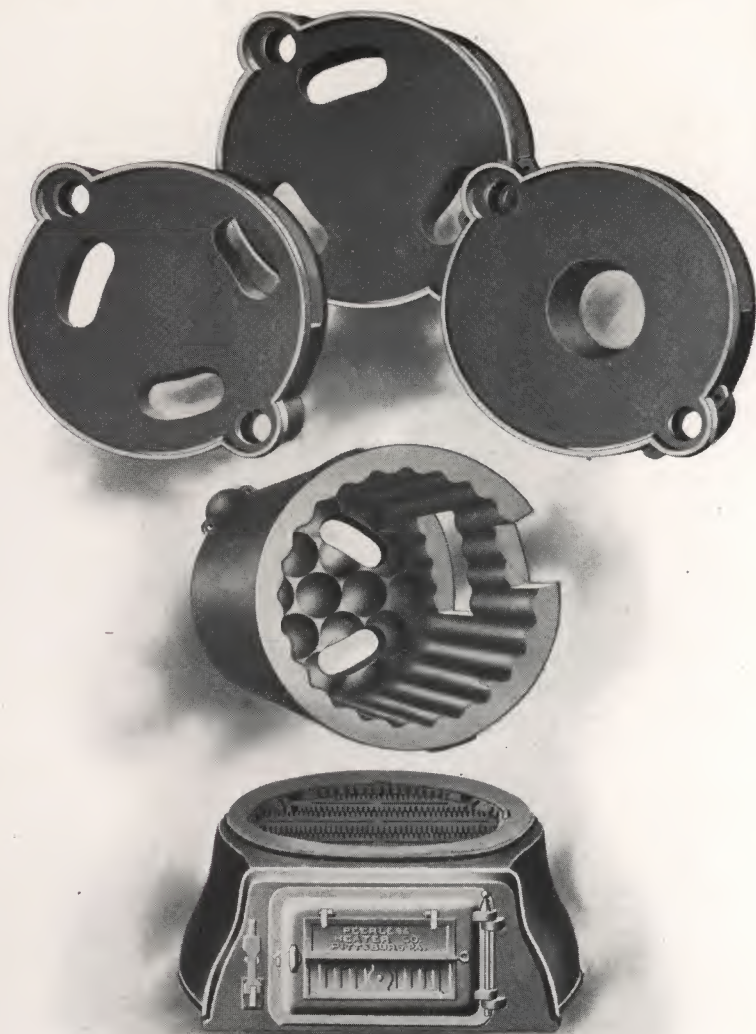
SELECTING SIZE OF BOILER

THE following extract is taken from the American Society of Heating and Ventilating Engineers' Guide, Volume One, 1922, page 135. "To select the boiler, the total heat emitted by the radiators, plus that emitted by the piping and connections should be taken as a basis and a boiler selected 50 to 100 per cent larger than the maker's rating. This factor of safety must be allowed to take care of the decrease in capacity of the boiler under poor draft conditions, soot coated surfaces and inefficient firing, poor quality coal and other conditions which often prevail in the use of such equipment. The ratings given by the manufacturers are under test conditions."

CHIMNEY SIZES—STRAIGHT DRAFT BOILERS

Boiler Rating		Height of Chimney in Feet	Size of Flue		
Steam Sq. Ft.	Water Sq. Ft.		Round	Rectangular	Area
500	825	35	8	8x 8	64
750	1250	35	10	8x12	96
1000	1650	35	10	8x12	96
1250	2075	40	10	8x12	96
1500	2475	40	12	12x12	144
2000	3300	50	14	12x16	192
2500	4175	50	14	12x16	192
3000	5100	50	16	16x16	256
4000	6675	60	18	16x20	320
5000	8350	60	20	20x20	400
6000	10025	60	22	20x24	480
7000	11700	65	24	24x24	576
8000	13375	65	26	24x28	672
9000	15025	70	28	28x28	784
10000	16700	70	30	28x32	896
11000	18350	70	30	30x30	900
12000	20025	80	32	32x32	1024

PEERLESS



SECTIONS—FIRE POT, GRATE AND BASE



NOTE



RA T I N G S of our boilers are for direct cast-iron radiation, and are based upon all piping (mains, risers, flows and returns) being figured as radiating surface. In the case of steam boilers, ratings are based on a standard of two (2) pounds pressure at the boiler; ratings of water boilers are based on a standard of water at a temperature of 180° F. as it leaves the boiler.

When a pipe coil or cast-iron section is placed in the fire pot of a heater, for the purpose of heating water for domestic use, additional capacity should be figured to determine the size of heater; viz., $1\frac{1}{4}$ square feet of direct radiation for steam and 2 square feet for hot water, for each gallon to be heated per hour. All of our boilers, except 15" round series, are tapped in rear to admit domestic coil.

We furnish with sectional boilers enough asbestos plastic cement to fill in all joints. On account of the increased efficiency and greater economy we recommend that all boilers be properly covered with asbestos plastic cement to a thickness of not less than $1\frac{1}{2}$ inches.

Ratings are also based upon the understanding that sufficient radiation be installed to heat the building properly; that the apparatus be properly put in; that the flue of the building be of sufficient capacity; and that the boiler when installed shall receive proper management and care.

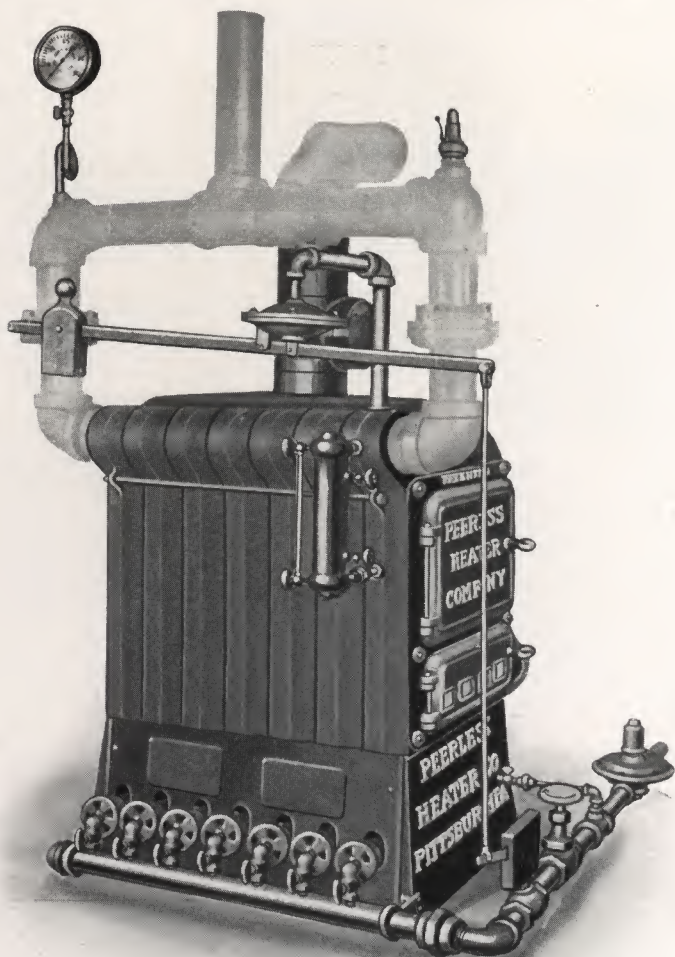
Our boiler ratings are based on the assumption that hard coal is to be used for fuel; when soft coal is to be used, one size larger boiler should be selected.

Our boilers are guaranteed only to the extent of furnishing new castings for any found to be defective in manufacture.

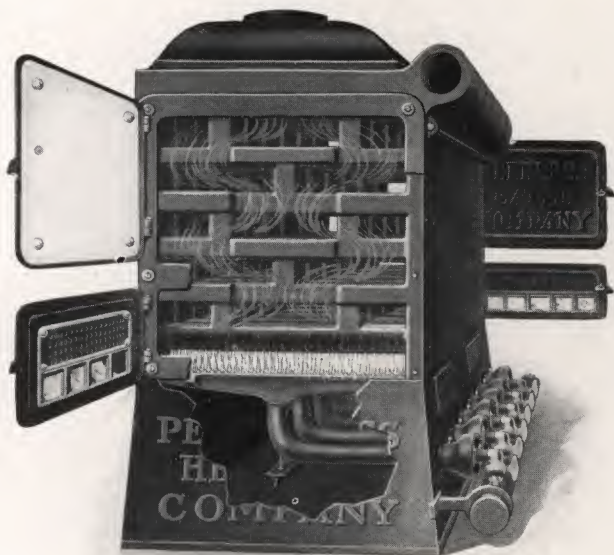
The ratings are made in accordance with above standards, but on account of the varying conditions surrounding the installation of boilers we do not guarantee them except as above.

Trimmings furnished with steam boilers consist of steam gauge with cock and syphon, water column, water gauge and cocks, automatic damper regulator and chain, and the necessary pipe and fittings to connect same with boiler. Fire tools consist of poker, hoe and flue brush. Water boilers are furnished with fire tools.

HC PEERLESS HC



PEERLESS GAS BOILER



PEERLESS GAS BOILER RATINGS

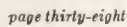
No. of Boiler	Steam or Vapor Sq. Ft.	Water Sq. Ft.	No. of Boiler	Steam or Vapor Sq. Ft.	Water Sq. Ft.	No. of Boiler	Steam or Vapor Sq. Ft.	Water Sq. Ft.
23	360	620	33	1940	3290	46	4020	6820
24	510	860	34	2100	3560	48	4340	7360
25	660	1120	35	2260	3840	50	4660	7900
26	820	1400	36	2420	4110	52	4980	8450
27	980	1670	37	2580	4380	54	5300	9000
28	1140	1940	38	2740	4650	56	5620	9530
29	1300	2200	39	2900	4920	58	5940	10010
30	1460	2480	40	3060	5200	60	6260	10550
31	1620	2750	42	3380	5740	62	6580	11200
32	1780	3010	44	3700	6280			

Height of boiler, including draft-hood, 52 inches. Water line, 31 inches.

NOTE.—We will be glad to furnish on request catalogue and price-sheets giving full information regarding our improved gas boiler.

Technical drawing of a multi-layered cylindrical structure, likely a component of a machine. The drawing shows a side view of the cylinder with a flange at the top. Dimensions are labeled with letters and numbers:

- N : Dimension of the flange.
- I : Dimension of the cylinder body.
- H : Dimension of the cylinder body.
- L : Dimension of the cylinder body.
- K : Dimension of the cylinder body.
- O : Dimension of the cylinder body.
- 7 : Dimension of the cylinder body.
- I : Dimension of the cylinder body.
- H : Dimension of the cylinder body.
- I : Dimension of the cylinder body.





MEASUREMENTS

Peerless Patented Sectional Boilers

Dimensions (Inches)	Series Number					
	18	24 and 25	30 and 36	40 and 48	38	50
A	23	28½	37¾	50½	37¾	50½
B	8x15	7¾x16¼	8½x17	9¼x18	8½x17	9¼x18
C	25	24½	26	27¾	40¾	43½
D	13½	16¾	19¼	26	19¼	26
E	23½	29¾	38¾	49½	38¾	49½
F	16½	16½	17	17	17	18½
G	40½	44	48	51	58	63
H	6½	6½	6½	7¾	6½	7¾
I	9½	9½	9¾	11¼	9¾	11¼
J	26	26	27	32	27	32
K	19½	19½	20¼	24	20¼	24
L	13½	13½	13½	13½	13½	13½
M	6¼	6¼	6½	7¾	6½	7¾
N	8	10	12	16	16	16
O	13	13	13½	16	13½	16

ASSEMBLY CHART FOR UP-DRAFT SMOKELESS

A = Front Section

B = Intermediate Tapped Section

C = Intermediate Plain Section

D = Bridgwall Section

E = Flue Section, Plain

F = Flue Section, Tapped

G = Back Section

Boiler No.	Number of Sections from Front of Boiler																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
825	A	B	C	C	B	D	F	G												
925	A	B	C	C	B	C	D	E	G											
1025	A	B	C	C	B	C	D	E	F	G										
1125	A	B	C	C	B	C	B	D	E	F	G									
836	A	B	C	C	C	D	B	G												
936	A	B	C	C	C	D	D	B	G											
1036	A	B	C	C	C	B	C	D	B	G										
1136	A	B	C	C	C	B	C	D	B	G										
1236	A	B	C	C	C	B	C	D	B	G										
1336	A	B	C	C	C	B	C	D	B	G										
848	A	B	C	C	B	D	F	G												
948	A	B	C	C	B	C	D	F	G											
1048	A	B	C	C	B	C	C	D	F	G										
1148	A	B	C	C	B	C	B	D	D	F	G									
1248	A	B	C	C	B	C	C	D	D	F	G									
1348	A	B	C	C	B	C	C	D	D	F	G									
1448	A	B	C	C	C	C	B	C	D	D	F	G								
1548	A	B	C	C	B	C	C	B	C	D	D	F	G							
1648	A	B	C	C	B	C	C	B	C	D	D	F	G							
1748	A	B	C	C	C	B	C	C	B	C	D	D	F	G						
1848	A	B	C	C	C	B	C	C	C	B	C	D	D	F	G					
1948	A	B	C	C	C	B	C	C	C	B	C	D	D	F	G					
2048	A	B	C	C	C	B	C	C	C	B	C	D	D	F	G					



CUBICAL CONTENTS OF ROOMS
Ceiling Height, 9 Feet

Length in feet	Width in feet										
	5	6	7	8	9	10	11	12	13	14	15
5	225	270	315	360	405	450	495	540	585	630	675
6	270	324	378	432	486	540	594	648	702	756	810
7	315	378	441	504	567	630	693	756	819	882	945
8	360	432	504	576	648	720	792	864	936	1008	1080
9	405	486	567	648	729	810	891	972	1053	1134	1215
10	450	540	630	720	810	900	990	1080	1170	1260	1350
11	495	594	693	792	891	990	1089	1188	1287	1386	1485
12	540	648	756	864	972	1080	1188	1296	1404	1512	1620
13	585	702	819	936	1053	1170	1287	1404	1521	1638	1755
14	630	756	882	1008	1134	1260	1386	1512	1638	1764	1890
15	675	810	945	1080	1215	1350	1485	1620	1755	1890	2025
16	720	864	1008	1152	1296	1440	1584	1728	1872	2016	2160
17	765	918	1071	1224	1377	1530	1683	1836	1989	2142	2295
18	810	972	1134	1296	1458	1620	1782	1944	2106	2268	2430
19	855	1026	1197	1368	1539	1710	1881	2052	2223	2394	2565
20	900	1080	1260	1440	1620	1800	1980	2160	2340	2520	2700
21	945	1134	1323	1512	1701	1890	2079	2268	2457	2646	2835
22	990	1188	1386	1584	1782	1980	2178	2376	2574	2772	2970
23	1035	1242	1449	1656	1863	2070	2277	2484	2691	2898	3105
24	1080	1296	1512	1728	1944	2160	2376	2592	2808	3024	3240
25	1125	1350	1575	1800	2025	2250	2475	2700	2925	3150	3375



CUBICAL CONTENTS OF ROOMS
Ceiling Height, 10 Feet

Length in feet	Width in feet										
	5	6	7	8	9	10	11	12	13	14	15
5	250	300	350	400	450	500	550	600	650	700	750
6	300	360	420	480	540	600	660	720	780	840	900
7	350	420	490	560	630	700	770	840	910	980	1050
8	400	480	560	640	720	800	880	960	1040	1120	1200
9	450	540	630	720	810	900	990	1080	1170	1260	1350
10	500	600	700	800	900	1000	1100	1200	1300	1400	1500
11	550	660	770	880	990	1100	1210	1320	1430	1540	1650
12	600	720	840	960	1080	1200	1320	1440	1560	1680	1800
13	650	780	910	1040	1170	1300	1430	1560	1690	1820	1950
14	700	840	980	1120	1260	1400	1540	1680	1820	1960	2100
15	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250
16	800	960	1120	1280	1440	1600	1760	1920	2080	2240	2400
17	850	1020	1190	1360	1530	1700	1870	2040	2210	2380	2550
18	900	1080	1260	1440	1620	1800	1980	2160	2340	2520	2700
19	950	1140	1330	1520	1710	1900	2090	2280	2470	2660	2850
20	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
21	1050	1260	1470	1680	1890	2100	2310	2520	2730	2940	3150
22	1100	1320	1540	1760	1980	2200	2420	2640	2860	3080	3300
23	1150	1380	1610	1840	2070	2300	2530	2760	2990	3220	3450
24	1200	1440	1680	1920	2160	2400	2640	2880	3120	3360	3600
25	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750



AREA OF EXPOSED WALL, SQUARE FEET

Length of exposed wall	Ceiling height, feet						Length of exposed wall	Ceiling height, feet					
	8	8½	9	10	11	12		8	8½	9	10	11	12
5	40	43	45	50	55	60	16	128	136	144	160	176	192
6	48	51	54	60	66	72	17	136	145	153	170	187	204
7	56	60	63	70	77	84	18	144	153	162	180	198	216
8	64	68	72	80	88	96	19	152	162	171	190	209	228
9	72	77	81	90	99	108	20	160	170	180	200	220	240
10	80	85	90	100	110	120	21	168	179	189	210	231	252
11	88	94	99	110	121	132	22	176	187	198	220	242	264
12	96	100	108	120	132	144	23	184	196	207	230	253	276
13	104	111	117	130	143	156	24	192	204	216	240	264	288
14	112	119	126	140	154	168	25	200	213	225	250	275	300

USE OF TABLES

Example: How many square feet of direct water radiation is required to heat to 70 degrees in zero weather a room 10' x 15', 15' side exposed, glass surface 60 square feet, ceiling height 8½ ft.?

Cu. Contents (Table, p. 41). . 1275 cu. ft. * . 12 sq. ft. radiation (Table, p. 46)
Area of exposed wall

(Table, p. 44). 128 sq. ft.

Glass Surface. 60 sq. ft. . . 29 sq. ft. radiation (Table, p. 46)

Net exposed wall surface. . . . 68 sq. ft. . . 10 sq. ft. radiation (Table, p. 46)

Sq. ft. water radiation. 51

*This number comes between two in the cubical contents column of the radiation table. In such cases, select the larger number in the table.



TABLE FOR STEAM RADIATION

Square Feet			Cubical Contents	Square Feet			Cubical Contents
Radiation	Glass	Exposed Wall		Radiation	Glass	Exposed Wall	
1	3	11	171	51	170	556	8743
2	6	22	343	52	173	567	8914
3	10	33	514	53	176	578	9086
4	13	43	686	54	180	589	9257
5	16	54	857	55	183	600	9428
6	20	65	1028	56	186	611	9600
7	23	76	1200	57	190	622	9771
8	26	87	1371	58	193	633	9943
9	30	98	1543	59	196	643	10114
10	33	109	1714	60	200	654	10286
11	36	120	1886	61	203	665	10457
12	40	131	2057	62	206	676	10628
13	43	142	2228	63	210	687	10800
14	46	153	2400	64	213	698	10971
15	50	163	2571	65	216	709	11143
16	53	174	2743	66	220	720	11314
17	56	185	2914	67	223	731	11486
18	60	196	3086	68	226	742	11657
19	63	207	3257	69	230	753	11828
20	66	218	3428	70	233	763	12000
21	70	229	3600	71	236	774	12171
22	73	240	3771	72	240	785	12343
23	76	251	3943	73	243	796	12514
24	80	262	4114	74	246	807	12686
25	83	273	4286	75	250	818	12857
26	86	283	4457	76	253	829	13028
27	90	294	4628	77	256	840	13200
28	93	305	4800	78	260	851	13371
29	96	316	4971	79	263	862	13543
30	100	327	5143	80	266	873	13714
31	103	338	5314	81	270	883	13886
32	106	349	5486	82	273	894	14057
33	110	360	5657	83	276	905	14228
34	113	371	5828	84	280	916	14400
35	116	382	6000	85	283	927	14571
36	120	393	6171	86	286	938	14743
37	123	403	6343	87	290	949	14914
38	126	414	6514	88	293	960	15086
39	130	425	6686	89	296	971	15257
40	133	436	6857	90	300	982	15428
41	136	447	7028	91	303	993	15600
42	140	458	7200	92	306	1003	15771
43	143	469	7371	93	310	1014	15943
44	146	480	7543	94	313	1025	16114
45	150	491	7714	95	316	1036	16286
46	153	502	7886	96	320	1047	16457
47	156	513	8057	97	323	1058	16628
48	160	523	8228	98	326	1069	16800
49	163	534	8400	99	330	1080	16971
50	166	545	8571	100	333	1091	17143



TABLE FOR WATER RADIATION

Square Feet			Cubical Contents	Square Feet			Cubical Contents
Radiation	Glass	Exposed Wall		Radiation	Glass	Exposed Wall	
1	2	7	107	51	106	348	5464
2	4	14	214	52	108	354	5571
3	6	20	321	53	110	361	5678
4	8	27	428	54	112	368	5785
5	10	34	535	55	114	375	5893
6	12	41	643	56	116	382	6000
7	14	48	750	57	119	389	6107
8	16	54	857	58	121	395	6214
9	18	61	964	59	123	402	6321
10	21	68	1071	60	125	409	6428
11	23	75	1178	61	127	416	6535
12	25	81	1285	62	129	423	6643
13	27	88	1393	63	131	429	6750
14	29	95	1500	64	133	436	6857
15	31	102	1607	65	135	443	6964
16	33	109	1714	66	137	450	7071
17	35	116	1821	67	139	457	7178
18	37	123	1928	68	141	463	7285
19	39	129	2035	69	144	470	7393
20	41	136	2143	70	146	477	7500
21	43	143	2250	71	148	484	7607
22	46	150	2357	72	150	491	7714
23	48	157	2464	73	152	498	7821
24	50	164	2571	74	154	504	7928
25	52	170	2678	75	156	511	8035
26	54	177	2785	76	158	518	8143
27	56	184	2893	77	160	525	8250
28	58	191	3000	78	162	532	8357
29	60	198	3107	79	164	539	8464
30	62	204	3214	80	166	545	8571
31	64	211	3321	81	168	552	8678
32	66	218	3428	82	171	559	8785
33	68	225	3535	83	173	566	8893
34	71	232	3643	84	175	573	9000
35	73	239	3750	85	177	579	9107
36	75	245	3857	86	179	586	9214
37	77	252	3964	87	181	593	9321
38	79	259	4071	88	183	600	9428
39	81	266	4178	89	185	607	9535
40	83	273	4285	90	187	614	9643
41	85	279	4393	91	189	620	9750
42	87	286	4500	92	191	627	9857
43	89	293	4607	93	194	634	9964
44	91	300	4714	94	196	641	10071
45	93	307	4821	95	198	648	10178
46	96	314	4928	96	200	654	10285
47	98	320	5035	97	202	661	10393
48	100	327	5143	98	204	668	10500
49	102	334	5250	99	206	675	10607
50	104	341	5357	100	208	682	10714



HEATING SURFACE PER SECTION CAST-IRON RADIATORS

Type of Radiator	Length per Section	Width of Section	Height of Radiator							
			45"	38"	32"	26"	23"	22"	20"	18"
1 col. . . .	2½"	4½"	.....	3	2½	2	1⅔	1⅔	1½	.....
2 col. . . .	2½"	7⅜"	5	4	3⅓	2⅔	2⅓	2¼	2	.....
3 col. . . .	2½"	9 "	6	5	4½	3¾	.....	3	.....	2¼
4 col. . . .	3 "	12½"	10	8	6½	5	.....	4	.....	3

WINDOW

Type of Radiator	Length per Section	Width of Section	Height of Radiator					
			20"	18"	17"	16"	14"	13"
5 col.	3"	13"	5½	.....	4¾	.....	4	.....
6 col.	3"	12½"	5	4½	.....	3¾	.....	3

WALL

Size of Section Inches (approximate)	Heating Surface Square Feet	Thickness Inches	Thickness with Brackets Inches
14x16	5	3	3½
14x22	7	3	3½
14x29	9	3	3½

PIN INDIRECT

Heating Surface Square Feet	Size of Section Inches (approximate)	Width of Each Section in Stock	Regular Tapping
10	36¼x 8⅝	3⅛	2
15	36⅝x11⅝	3¼	2
20	36¾x15¾	3½	2



PIPE TABLE *—Capacity of Mains and Risers in Square Feet of Direct Radiation

Pipe size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8
Length per sq. ft. of surface	4.547	3.637	2.904	2.301	2.010	1.608	1.328	1.091	.954	.848	.686	.576	.442
Internal cross-sectional area of standard wrought-iron pipe, sq. in.	.304	.533	.864	1.496	2.036	3.356	4.778	7.393	9.887	12.730	20.006	28.891	51.161
STEAM													
Supply mains, all systems, down-feed risers			50	100	175	350	600	1000	1500	2000	3800	6000	13,000
Up-feed risers, one-pipe system				50	100	200	300	500	700	800	1,300	1,800	3,000
Dry return lines, two-pipe and vapor systems		50	150	300	900	2,000	3,800	6,000	10,000	13,000	23,000	37,000	78,000
Wet return lines			2,000	3,800	6,000	13,000	23,000	37,000	55,000	78,000			
Vacuum return lines	100	400	800	1,500	3,000	6,000	10,000	18,000	30,000	40,000	65,000		
Radiator connection, single pipe, Up to			24	60	100	Above 100							
Radiator connection (supply), two-pipe, Up to			48	96	Above 96			Return connections, one size smaller.					
HOT WATER													
Main 100' long, two-pipe, up-feed				75	110	200	310	540	780	1,100	1,900	3,000	4,300
Expansion Tanks													
									Capacity Gallons	Size Inches	Square feet Radiation		
Risers, 1st floor			33	71	100	187	292	500	10	12 x 20	300		
Risers, 2d floor			46	104	140	262	410	755	15	12 x 30	500		
Risers, 3d floor			57	124	175	325	492	875	20	14 x 30	700		
Risers, 4th floor			64	142	200	375	580	1,000					
Radiator connection, supply and return, Up to			40	72	Above 72				26	16 x 30	950		
									32	16 x 36	1,300		
									42	16 x 48	2,000		

* Data taken from "Heating and Ventilation," by John R. Allen and J. H. Walker.

